REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Status of the Claims

Claims 3, 6, 9 and 12 are currently being amended. The feature of the amended claims are supported in the Original Specification, for example, at page 10, line 5 to page 11, line 14. Thus no new matter is added. Claims 4, 5, 7, 8, 10, 11, 13, 14 are requested to be cancelled without prejudice or disclaimer. Claims 17-22 are added. New claims 17 and 18 depend from claim 9 and include subject matter from previously presented claims 15 and 16, respectively. Features of new claims 19 and 20 are supported by the Original Specification, for example, at page 11, line 1 to page 12, line 17. Features of claims 21 and 22 are supported by the Original Specification, for example, at page 11, lines 8-20. Thus no new matter is added.

Claim Rejections Under 35 U.S.C. 103

Claims 3, 9, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyidi et al. ("Growth of CeO2 thin films..."; hereinafter Eyidi) in view of Hans Thieme et al. (U.S. Patent No. 6,458,223; hereinafter Hans) and JP 07-105750 (hereinafter '750) and Hsu (U.S. 6,569,745; hereinafter Hsu). Claims 6, 12, are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyidi in view of Hans, '750, Hsu and Akedo et al. (U.S. Patent No. 6,827,634; hereinafter Akedo). There rejections are respectfully traversed.

Independent claims 3 and 9, as amended, recite a method of producing a superconducting wire that includes, thermally treating said textured metal substrate at a temperature of 500°C to 800°C in a reduced or vacuumed atmosphere at least once, after planarizing a texture metal substrate and before depositing a superconducting layer and an intermediate layer, respectively, on said textured metal substrate. The references of record fail to teach or suggest a method of producing a superconducting wire having at least the above recited features of claims 3 and 9.

For example, Eyidi fails to teach or suggest, thermally treating said textured metal substrate at a temperature of 500°C to 800°C in a reduced or vacuumed atmosphere at least

once. In particular, Eyidi teaches an anneal temperature greater than 850°C (Page 15, the left column, section starting II. Experimental). Eyidi may refer to other temperatures such as 650-670°C, but those temperatures refer to the temperature at which the deposition of CeO_2 occurs on the substrate (Page 15, the left column, section starting II. Experimental). Claims 3 and 9 recite, among other features, depositing a superconducting layer on said metal textured metal substrate that has been thermally treated. However, Eyidi teaches depositing CeO_2 during heat treating at a temperature of 650-670°C. Accordingly, Eyidi fails to teach or suggest, a method of producing a superconducting wire that includes thermally treating said textured metal substrate at a temperature of 500°C to 800°C in a reduced or vacuumed atmosphere at least once and depositing a superconducting layer on said textured metal substrate that has been thermally treated.

Goyal recites annealing at temperatures in excess of 800°C (Column 5, lines 44-45). Goyal may disclose other annealing temperatures, however, those temperatures are used after the deposition of other layers. (Column 9, lines 24-31) As discussed in greater detail below, various advantages may be realized by thermally treating a substrate at a temperature of 500°C to 800°C. Therefore, Eyidi and Goyal, alone or in combination, fail to teach or suggest at least the above recited features of claims 3 and 9.

'750 fails to teach or suggest, a method of producing a superconducting wire that includes thermally treating said textured metal substrate at a temperature of 500°C to 800°C in a reduced or vacuumed atmosphere at least once. In particular, '750 directed to a Polycrystalline metallic base with crystal face (110) that is normal to the metallic based substance. (Paragraph [0023]) '750 fails to mention thermally treating the polycrystalline metallic base at the temperatures recited in claims 3 and 9.

Hsu is directed to a shared bit line cross point memory array structure. (Abstract) In particular, Hsu recites an oxide deposited on a substrate having a thickness of 500 nm and 1000 nm where the oxide is planarized to a thickness of between approximately 50 nm and 500 nm. (Column 2, lines 60-66) Hsu fails to mention thermally treating the substrate at the temperatures recited in claims 3 and 9.

Akedo fails to teach or suggest, a method of producing a superconducting wire that includes thermally treating said textured metal substrate at a temperature of 500°C to 800°C in

a reduced or vacuumed atmosphere at least once. Instead, Akedo discloses using a pressure apparatus to press a deposited film of ultra fine particles. (Col. 5, lines 45-53) Akedo fails to mention thermally treating the substrate as recited in claims 3 and 9.

Hans fails to teach or suggest, a method of producing a superconducting wire that includes thermally treating said textured metal substrate at a temperature of 500°C to 800°C in a reduced or vacuumed atmosphere at least once. Hans is cited as disclosing that if the surface roughness exceeds 10-20 nm Ra the current carrying capcity of the superconductor film can be strongly reduced. (Column 11, line 65 to column 12, line 3) Hans fails to mention thermally treating the substrate as recited in claims 3 and 9.

The Original Specification discloses various advantages that may be realized by thermally treating at a temperature of 500°C to 800°C. Moreover, the Original specification discloses various disadvantages of thermally treating at temperatures outside the claimed range. For example, if the substrate is thermally treated at a temperature lower than 500°C, then the substrate may have a surface layer insufficiently recovered in biaxial texture. (Original Specification, page 11, lines 11-12) Moreover, if the substrate is thermally treated at a temperature higher than 800°C, the substrate in its entirety can be reduced in biaxial texture. (Original Specification, page 11, lines 13-15) Thermally treating the substrate at a temperature of 500°C to 800°C yields a biaxially textured metal surface that is suitable for depositing a superconducting layer with higher critical current density. (See. for example, first examples through eight example)

Therefore, claims 3 and 9 are believed to be allowable. Claims 6, 15 and 16 depend from claim 3, they are believed to be allowable for at least the same reasons claim 3 is believed to be allowable. Claim 12 depends from claim 9, it is believed to be allowable for at least the same reasons claim 9 is believed to be allowable.

Claims 4, 5, 10 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Eyidi in view of Hans, '750, Hsu and Goyal et al. (U.S. Patent No. 6,451,450; Goyal). Claims 7, 8, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyidi in view of Hans, '750, Hsu, Goyal and Akedo. Claims 4, 5, 7, 8, 10, 11, 13 and 14 have been cancelled, accordingly, the rejections regarding those claims are moot.

New Claims

New claims 17 – 22 are added to further protect aspects of the present invention. New claims 17 – 22 are supported by the present disclosure, as discussed above. New claims 17 – 22 are each dependent on independent claim 3 or 9. Accordingly, each of the new claims 17 – 22 is patentably distinguishable over the references of record, at least for reasons as discussed above with respect to claims 3 and 9. In addition each new claim 17 - 22 is further distinguished from the references of record.

For example, new claim 17 is dependent on claim 9, and incorporates every feature of the parent claim and further recites, planarizing the textured metal substrate comprises planarizing the textured metal substrate such that the crystal axis is offset relative to the orientation axis by at most 12°. As discussed above regarding claim 9, the references of record fail to teach, suggest or make predictable, thermally treating said textured metal substrate at a temperature of 500°C to 800°C in a reduced or vacuumed atmosphere at least once. Therefore, claim 17 is believed to be allowable.

For example, new claim 18 is dependent on claim 9, and incorporates every feature of the parent claim and further recites, planarizing the textured metal substrate comprises planarizing the textured metal substrate such that the crystal axis is offset relative to the orientation axis by at most 10°. As discussed above regarding claim 9, the references of record fail to teach, suggest or make predictable thermally treating said textured metal substrate at a temperature of 500°C to 800°C in a reduced or vacuumed atmosphere at least once. Therefore, claim 18 is believed to be allowable.

For example, new claims 19 and 20 are dependent on claims 3 and 9, respectively and incorporates every feature of the parent claims and further recite thermally treating said textured metal substrate occurs at a temperature of 600°C to 700°C in a reduced or vacuumed atmosphere at least once. As discussed above regarding claims 3 and 9, the references of record fail to teach, suggest or make predictable the thermally treating said textured metal substrate occurs at a temperature greater than 500°C to a temperature less than 800°C in a vacuumed atmosphere at least once. Accordingly the references of record fail to teach or suggest a method that includes thermally treating said textured metal substrate occurs at a

temperature of 600°C to 700°C in a reduced or vacuumed atmosphere at least once. Therefore claims 19 and 20 are believed to be allowable.

For example, new claim 21 is dependent on claim 3, and incorporates every feature of the parent claim and further recites, the vacuumed atmosphere is vacuumed to a pressure of less than 1.33 X 10^2 Pa. As discussed above regarding claim 3, the references of record fail to teach, suggest or make predictable thermally treating said textured metal substrate at a temperature of 500°C to 800°C in a reduced or vacuumed atmosphere at least once. Moreover, the references of record fail to teach or suggest vacuuming or vacuuming to a pressure of less than 1.33 X 10^2 Pa. Therefore, claim 21 is believed to be allowable.

For example, new claim 22 is dependent on claim 3, and incorporates every feature of the parent claim and further recites, the thermal treatment occurring for at least 2 minutes. As discussed above regarding claim 3, the references of record fail to teach, suggest or make predictable thermally treating said textured metal substrate at a temperature of 500°C to 800°C in a reduced or vacuumed atmosphere at least once. Moreover, the references of record fail to teach or suggest the time period of their thermal treatment that occur at higher temperatures. Therefore, claim 22 is believed to be allowable.

Concluding Remarks

After amending the claims as set forth above, claims 3, 6, 9, 12, and 15-22 are pending in this application.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely

acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date: February 9, 2010

By: _____

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